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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/024,892	12/18/2001	Jong Heon Kim	CU-2641 VE	5171

26530 7590 06/17/2003

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EXAMINER

LATTIN, CHRISTOPHER W

ART UNIT	PAPER NUMBER
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2812

DATE MAILED: 06/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No.	Applicant(s)	
	10/024,892	KIM, JONG HEON	
	Examiner	Art Unit	
	Christopher W Lattin	2812	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____ .
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-14, 16-20 and 22-26 is/are rejected.
- 7) ☒ Claim(s) 4, 15, 21 and 27 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____ .
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____ . |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>3</u> . | 6) <input type="checkbox"/> Other: ____ . |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-2, 5, 8, 10, 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Elenius et al. (U.S. Patent 6,287,893).

Elenius et al. teach a fabrication method of a wafer level package comprising the steps of: providing a substrate 14 having a plurality of chip pads 18 on the upper part thereof; forming a first polyimide insulating layer 24 including a first opening by photolithography, exposing the chip pad and a second opening forming a ball land on the substrate; forming a metal wiring 30 connected to the chip pad 18 in a single unit through the first opening and covering the second opening to provide a ball land on the first insulating layer; forming a second polyimide insulating layer 33 including a third opening which covers the metal wiring, except for the third opening, which exposes the metal wiring and defining the ball land; and adhering a conductive ball 28 to the metal

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wiring 30 exposed by the third opening, the conductive ball 28 being in contact with the defining ball land exposed by third opening.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6, 7, 9, 12-14, 16, 19-20, 22, 23 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Elenius et al. (U.S. Patent 6,287,893) in view of Bartush et al. (U.S. Patent 6,413,868).

The Elenius et al. reference is applied supra and teaches a fabrication method of a wafer level package comprising the steps of: providing a substrate 14 having a plurality of chip pads 18 on the upper part thereof; forming a first polyimide insulating layer 24 including a first opening by photolithography, exposing the chip pad and a second opening forming a ball land on the substrate; forming a metal wiring 30 connected to the chip pad 18 in a single unit through the first opening and covering the second opening to provide a ball land on the first insulating layer; forming a second polyimide insulating layer 33 including a third opening which covers the metal wiring, except for the third opening, which exposes the metal wiring and defining the ball land; and adhering a conductive ball 28 to the metal wiring 30 exposed by the third opening, the

conductive ball 28 being in contact with the defining ball land exposed by third opening, but fails to teach that the second opening is formed using laser irradiation on the first insulating layer, wherein the irradiated energy is in the range of from 0.1 to 2.0 Joule/cm².

Claims 3, 17, 18, 24, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Elenius et al. (U.S. Patent 6,287,893) in view of Bartush et al. (U.S. Patent 6,413,868) as applied to claims 1, 12 and 20 above and further in view of Lee et al. (U.S. PAP 2002/0140069 A1).

Elenius et al. in view of Bartush et al. teach all of the limitations of the claimed fabrication methods according to claims 1, 12 and 20, but fail to teach that the opening in the second insulating layer is essentially the same as the width of the conductive ball and has a width wider than that of the second opening. Lee et al. teach a method of forming an opening in a second layer 370 that is wider than an opening in a first layer 350 and essentially the same as the solder ball 400. See Figure 3f. It would have been obvious to one skilled in the art at the time of the invention to form an opening in a second layer that is wider than an opening in a first layer and essentially the same as the solder ball as taught by Lee et al. in order to conform the insulating layers taught by Elenius et al. in view of Bartush et al. around the circumference of the solder ball.

Allowable Subject Matter

Claims 4, 15, and 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record fails to adequately anticipate or obviate either singularly or in combination with another reference a fabrication method of a wafer level package according to claim 1, 14 or 20 wherein the first and second openings are formed by exposing the first insulating layer and conducting irradiation in different degrees.

Double Patenting


Claim 27 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 15. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Lattin whose telephone number is (703) 305-3017. The examiner can normally be reached Monday through Friday from 8:00 A.M. to 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling, can be reached at (703) 308-3325. The fax numbers for this Group are (703) 872-9318 for responses to non-final actions and (703) 872-9319 responses to final actions.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.

CWL 
June 9, 2003


John F. Niebling
Supervisory Patent Examiner
Technology Center 2800